

USN: 09/364,967
Group Art Unit: 2857
Attorney Docket No.: 151P08035US01

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of determining ~~the current status and a~~ remaining life of a power source having a voltage in an implantable neurological tissue stimulator medical device comprising the steps of:

assessing the ~~power source voltage of the power source in~~through an implantable neurological tissue stimulator; actual measurement;

determining, based on the ~~assessed power source voltage, where the voltage of the power source, capacity information of the power source is in its power source life cycle;~~

obtaining a ~~used capacity of the power source and a time that the power source has been operating, wherein the used~~ through an actual measurement; and

determining the remaining life of the power source based on the capacity and the time are variables that reflect actual historical power consumption of the implantable neurological tissue stimulator; and

~~determining the remaining life of the power source based on the used capacity~~ information of the power source and the time that the power source has been operating.
2. (Currently Amended) The method of claim 1 wherein the step of assessing the power source voltage ~~is done by connecting the power source to a~~ utilizes an analog to digital (A/D) converter.
3. (Currently Amended) The method of claim 1 wherein the step of determining ~~where the power source is in its power source life cycle includes the step of~~ capacity information of the power source comprises determining the ~~a~~ remaining power source capacity.
4. (Canceled)

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5. (Currently Amended) The method of claim 1 wherein the step of determining the remaining life time of the power source includes the steps of:

determining ~~thea~~ probable usage rate of the power source from the capacity information; and

dividing ~~thea~~ determined remaining capacity by the probable usage rate of the power source.
6. (Previously Presented) The method of claim 1 wherein the step of determining the remaining life of the power source includes the step of determining the probable usage rate of the power source.
7. (Currently Amended) The method of claim 6 wherein the step of determining the ~~probably~~probable usage rate of the power source includes the step of determining the used capacity of the power source.
8. (Currently Amended) The method of claim 7 wherein the step of determining the probable usage rate of the power source includes the step of dividing the determined used capacity of the power source by the length of time that the implantable neurological tissue stimulator medical device has been working.
9. (Currently Amended) The method of claim 6 wherein the step of determining the ~~probably~~probable usage rate of the power source includes the step of determining the used capacity of the power source since the last time the implantable neurological tissue stimulator medical device was reprogrammed.
10. (Currently Amended) The method of claim 8-9 wherein the step of determining the ~~probably~~probable usage rate of the power source includes the step of dividing the determined used capacity of the power source since the last time the implantable neurological tissue stimulator was reprogrammed by the length of time since the implantable neurological tissue stimulator medical device was reprogrammed.

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11. (Canceled)
12. (Currently Amended) The method of claim 1 wherein the step of determining ~~where capacity information of the power source is in its power source life cycle~~ includes the step of correlating, in a "look-up table", the power source voltage assessed in the step of assessing the power source voltage to a predetermined "power source capacity remaining" value.
13. (Currently Amended) The method of claim 1 wherein the step of determining ~~capacity information where the power source is in its power source life cycle~~ includes the step of correlating, in a "look-up table", the power source voltage assessed in the step of assessing the power source voltage to a predetermined "power source capacity used" value.
14. (Currently Amended) The method of claim 1 wherein the step of determining ~~capacity information of where the power source is in its power source life cycle~~ includes the step of determining the power source capacity used and then subtracting this value from the total power source capacity;
whereby, the power source capacity remaining is determined.
15. (Currently Amended) The method of claim 1 wherein the step of determining ~~where capacity information of the power source is in its power source life cycle~~ includes the step of determining the power source capacity remaining and then subtracting this value from the total power source capacity;
whereby, the power source capacity used is determined.
16. (Currently Amended) The method of claim 1 wherein the step of determining ~~where capacity information of the power source is in its power source life cycle~~ includes the step of calculating, using the ~~power source voltage of the power source~~ determined in the step of assessing the ~~power source voltage of the power~~

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~~source in an implantable neurological tissue stimulator~~, the remaining power source capacity by a formula.

17. (Currently Amended) A method of determining the current status and remaining life of a power source in an implantable ~~neurological tissue stimulator~~ medical device comprising the steps of:

assessing the power source voltage of the power source in an implantable ~~neurological tissue stimulator~~ medical device;

determining, based on the assessed power source voltage, where the power source is in its power source life cycle by calculating the remaining power source capacity by using a formula of the form: Remaining Battery Capacity = a constant + a constant multiplied by the power source voltage determined in the step of assessing the power source voltage of the power source in an implantable ~~neurological tissue stimulator~~ medical device; and

taking appropriate action in response to the determination of where the power source is in its power source life cycle.

18. (Original) The method of claim 16 wherein the step of calculating the remaining power source capacity by a formula includes the step of calculating the remaining power source capacity by using a non-linear formula.

19. (Canceled)

20. (Currently Amended) A method of determining the current status and remaining life of a power source in an implantable ~~neurological tissue stimulator~~ medical device comprising the steps of:

assessing the power source voltage of the power source in an implantable ~~neurological tissue stimulator~~ medical device;

determining, based on the assessed power source voltage, where the power source is in its power source life cycle by calculating the power source capacity by using

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a formula of the form: power source capacity used = a constant + a constant multiplied by the power source voltage determined in the step of assessing the power source voltage of the power source in an implantable neurological tissue ~~stimulator~~medical device; and

taking appropriate action in response to the determination of where the power source is in its power source life cycle.

21. (Canceled)
22. (Currently Amended) The method of claim 1 further comprising the step of informing the user of ~~where in the status of~~ the power source life ~~the power source is~~.
23. (Currently Amended) The method of claim 22 wherein the step of informing the user of ~~where in the power source life the power source is~~ includes the step of displaying a representation of the percentage of power source capacity used.
24. (Currently Amended) The method of claim 22 wherein the step of informing the user of ~~where in the power source life the power source is~~ includes the step of displaying a representation of the percentage of power source capacity remaining.
25. (Currently Amended) The method of claim 22 wherein the step of informing the user of ~~where in the power source life the power source is~~ includes the step of determining whether the remaining power source capacity falls within a predetermined limit.
26. (Original) The method of claim 25 wherein the step of determining whether the remaining power source capacity falls within a predetermined limit further includes the step of alerting the user if the remaining power source capacity falls within a predetermined limit.

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27. (Original) The method of claim 26 wherein the step of alerting the user if the remaining power source capacity falls within a predetermined limit further includes the step of alerting the user by triggering an alarm.

28. (Previously Presented) The method of claim 27 wherein the step alerting the user by triggering an alarm includes the step of triggering an alarm chosen from the group consisting of audible or visual warnings.

29. (Canceled)

30. (Currently Amended) A device for determining the ~~current~~ status and remaining life of a power source in an implantable neurological tissue stimulator, device comprising:

an implantable neurological tissue stimulator, the implantable neurological tissue stimulator having:

a source of power having a voltage;

a voltage determining system for determining the voltage of the source of power through an actual measurement;

a programmer for creating and processing information to be sent to and received from the implantable neurological tissue stimulator, the programmer including a processor and a memory attached thereto;

a system for communicating information between the implantable neurological tissue stimulator and the programmer;

wherein the voltage determining system for ~~determining the voltage of the source of power~~ passes the ~~determined~~ voltage of the source of power to the system for communication; and

wherein the system for communication passes the ~~determined~~ voltage of the source of power from the implantable neurological tissue stimulator to the programmer and to the processor, and

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wherein the processor determines, based on the determined voltage of the source of power, ~~where the source of power is in its life cycle; obtains a used capacity information of the power source and determines the remaining life of the power source based on the capacity information of the power source and a time that the power source has been operating, wherein the used capacity and the time are variables that reflect obtained through an actual historical power consumption of measurement.~~

31. (Currently Amended) The device of claim 30 wherein the processor determines ~~where the source of power is in its life cycle the capacity information of the power source~~ by correlating the determined voltage with a remaining capacity value stored in a "look-up" table.
32. (Currently Amended) The device of claim 30 wherein the processor determines ~~where the source of power is in its life cycle the capacity information of the power source~~ by correlating the determined voltage with a used capacity value stored in a "look-up" table.
33. (Currently Amended) The device of claim 30 wherein the processor determines ~~where the source capacity information of the power is in its life cycle source~~ by calculating the remaining capacity ~~in of~~ the source of power by using a predetermined formula.
34. (Currently Amended) The device of claim 30 wherein the processor determines ~~where the source capacity information of the power is in its life cycle source~~ by calculating the used capacity of the source of power by using a predetermined formula.
35. (Original) The device of claim 30 wherein the power source is a battery.
36. (Original) The device of claim 30 wherein the power source is a capacitor.

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37. (Previously Presented) A method of electrically stimulating nervous tissue in a patient, comprising the steps of:
- implanting in the patient a pulse generator having a power source, and a lead connected to the pulse generator;
 - stimulating nervous tissue with electrical pulses generated by the pulse generator and communicated by the lead;
 - controlling the pulse generator within preset limits by the patient to adjust stimulation of nervous tissue;
 - determining the status and remaining life of the power source as set forth in claim 1.
38. (Previously Presented) A method of electrically stimulating nervous tissue in a patient, comprising the steps of:
- implanting in the patient a pulse generator having a power source, and a lead connected to the pulse generator;
 - stimulating nervous tissue with electrical pulses generated by the pulse generator and communicated by the lead;
 - controlling the pulse generator within preset limits by the patient to adjust stimulation of nervous tissue;
 - determining the status and remaining life of the power source as set forth in claim 23.
39. (Previously Presented) A method of electrically stimulating nervous tissue in a patient, comprising the steps of:
- implanting in the patient a pulse generator having a power source, and a lead connected to the pulse generator;
 - stimulating nervous tissue with electrical pulses generated by the pulse generator and communicated by the lead;

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controlling the pulse generator within preset limits by the patient to adjust stimulation of nervous tissue;

determining the status and remaining life of the power source as set forth in claim 27.

40. (New) The method of claim 1 wherein the step of determining the remaining life of the power source includes the steps of:

determining a probable usage rate of the power source from the capacity information and the time that the power source has been operating; and

determining the remaining life of the power source as a function of the capacity information and the probable usage rate.

41. (New) The method of claim 40 wherein said determining the remaining life of the power source step comprises:

determining a remaining capacity of the power source from the capacity information; and

calculating the remaining life of the power source by dividing the remaining capacity of the power source by the probable usage rate of the power source.

42. (New) The method of claim 41 wherein said capacity information is a used capacity of the power source.

43. (New) The method of claim 42 wherein the remaining capacity of the power source is determined from the used capacity of the power source.

44. (New) The method of claim 43 wherein the remaining capacity of the power source is determined by subtracting the used capacity of the power source from a total capacity of the power source.

45. (New) The method of claim 41 wherein the probable usage rate is a capacity of the power source used per unit time.

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46. (New) The method of claim 41 wherein the determining the remaining capacity of the power source is calculated by using a formula of the form: Remaining Battery Capacity = a constant + a constant multiplied by the voltage of the power source determined in the step of assessing the voltage of the power source.
47. (New) The method of claim 41 wherein the determining the remaining capacity of the power source is calculated by using a formula of the form: power source capacity used = a constant + a constant multiplied by the power source voltage determined in the step of assessing the voltage of the power source.